Complete Summary

GUIDELINE TITLE

Guidelines of care for liposuction.

BIBLIOGRAPHIC SOURCE(S)

Coleman WP 3rd, et al. Guidelines of care for liposuction. Guidelines/Outcomes Committee. J Am Acad Dermatol 2001 Sep;45(3 Pt 1):438-47. [52 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Unwanted fat (adipose tissue)

GUIDELINE CATEGORY

Counseling
Evaluation
Management
Risk Assessment

CLINICAL SPECIALTY

Anesthesiology
Dermatology
Plastic Surgery
Surgery

INTENDED USERS

Hospitals
Other
Physicians
Public Health Departments

GUIDELINE OBJECTIVE(S)

- To address current areas of controversy related to liposuction in the United States.
- To provide guidance on the safe performance of tumescent liposuction surgery to dermatologists who perform the procedure.
- To inform the public debate on the safe performance of liposuction.

TARGET POPULATION

Patients undergoing liposuction surgery.

INTERVENTIONS AND PRACTICES CONSIDERED

1. Liposuction/tumescent liposuction technique
2. Preoperative medical and psychosocial evaluation of the patient
3. Anesthesia:
    - Local anesthetic (lidocaine)
    - Oral anxiolytics, sedatives, or narcotic analgesics with tumescent liposuction
    - Intravascular anxiolytics, sedatives or narcotic analgesics

    Note: Inhalational (general) anesthesia is considered but not recommended for tumescent liposuction.

4. Intra- and postoperative monitoring, including:
    - Baseline vital signs (blood pressure and heart rate)
    - Cardiac monitoring with pulse oximetry
    - Postoperative compression (binders, tape, anti-phlebitis support hose)
5. Physician qualifications
6. Facility and emergency medical preparedness

MAJOR OUTCOMES CONSIDERED

- Morbidity and mortality associated with liposuction
- Revisions required to improve result of initial procedure
- Cosmetic results
- Patient comfort/satisfaction

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The American Academy of Dermatology contracted with the Indiana University medical library to perform a comprehensive literature search using the university's access to the National Library of Medicine's MEDLINE database. The search was performed on seven issues identified by the Task Force: (1) physician qualifications; (2) facility in which procedure is performed; (3) preoperative medical and psychosocial evaluation of patient; (4) type of anesthesia employed; (5) surgical technique/procedure; (6) type of intra- and postoperative monitoring; (7) postoperative compression. Editorials and reviews were excluded; letters were included if they contained case reports.

NUMBER OF SOURCE DOCUMENTS

451 documents were identified and reviewed

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Level of Evidence Rating (See following Criteria)

Strong: Based on high quality scientific evidence

Moderate: Based on good quality scientific evidence

Expert opinion: Based on limited scientific evidence and Task Force opinion

Clinical Option: Intervention that the Task Force failed to find compelling evidence for or against and that a reasonable provider might or might not wish to implement

Level of Evidence Criteria

Attributes of Study on Diagnosis

1. Good diagnostic test
2. Good diagnostic criteria
3. Test and criteria reproducible
4. Proper patient selection
5. At least 50 cases and 50 controls

Level 1 = all attributes 1-5; Level 2 = 4 of the 5 attributes; Level 3 = 3 of the 5 attributes; Level 4 = 2 of 5 attributes; Level 5 = 1 of 5 attributes
High quality evidence = Levels 1 and 2
Good quality evidence = Level 3
Limited evidence = Levels 4 and 5

Attributes of Study on Prognosis

1. Cohort
2. Good inclusion/exclusion criteria
3. Follow-up of a least 80%
4. Adjustment for confounders
5. Reproducible outcome measures

Level 1 = all attributes 1-5; Level 2 = attribute 1 + any 3 of attributes 2-5; Level 3 = attribute 1+ any 2 of attributes 2-5; Level 4 = attribute 1 + any 1 of attributes 2-5; Level 5 = attribute 1 and no other attributes; Level 6 = none of the attributes.
High quality evidence = Levels 1 and 2
Good quality evidence = Levels 3 and 4
Limited evidence = Level 5

Levels of Evidence of Studies on Treatment and Prevention

1. Several randomized controlled trials (RCTs) that demonstrate a significant difference
2. A randomized controlled trial that demonstrates a significant difference
3. A randomized controlled trial showing some difference
4. A nonrandomized controlled trial or subgroup analysis of a randomized controlled trial
5. A comparison study with some kind of control/comparison
6. Case series without control
7. Case report with <10 patients

High quality evidence = Levels 1, 2, or 3
Good quality evidence = Levels 4 or 5
Limited evidence = Levels 6 or 7

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not applicable

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

At a meeting of the task force on February 12, 2000 the evidence tables and full text of articles were reviewed. The task force formed into smaller groups of 2-4 persons to thoroughly review the articles by issue. The task force then came together as a whole to review and discuss the sub-group recommendations. All

recommendations were discussed and final recommendations were agreed by unanimous oral vote. Included/excluded articles were updated post-meeting. It was agreed to exclude articles on submental liposuction, which is generally < 100ml. Based on the discussion and included articles the text was written and distributed to task force members on March 8, 2000 for final agreement and sign-off. All comments received from the task force members were acted upon by agreement between the Guidelines/Outcomes Committee Chair and the Liposuction Guidelines Task Force Chair.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Recommendation Rating

Recommendations are based on:

Unanimous Task Force opinion supported by strong to moderate levels of evidence

Majority Task Force opinion supported by strong to moderate levels of evidence

Unanimous Task Force opinion supported by limited or weak scientific evidence

Majority Task Force opinion supported by limited or weak scientific evidence

Unanimous Task Force opinion only

Majority Task Force opinion only

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The draft guideline was sent to three expert reviewers for a 45-day review and comment period.

Comments from the experts were reviewed and acted upon by the Guidelines/Outcomes Committee in consultation with the task force chair. The guideline was then sent to the members of the Board of Directors for a 30-day comment period. Board member comments were reviewed and acted upon by the Committee in consultation with the Task Force Chair.

The draft guideline was published as a draft and mailed to the entire American Academy of Dermatology membership for a 45-day comment period commencing

October 15, 2000. In consultation with the Task Force Chair, the Committee acted upon all comments received during a December 6, 2000 phone conference. The Committee approved final draft was submitted to the Board of Directors for final Board approval at the December 2000 Board meeting. The Board of Directors approved the guideline on December 10, 2000.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Excerpted and Summarized by the National Guideline Clearinghouse (NGC):

The levels of evidence (L1-L6), and strength of recommendation ratings are defined after the "Major Recommendations." Citations in support of individual recommendations are identified in Table 1 of the original guideline document.

Physician qualifications

1. The physician performing liposuction has completed residency training or is board certified in a specialty that is recognized by the American Board of Medical Specialties, and that provides education in liposuction and training in cutaneous surgery.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

2. The physician has documented liposuction training in residency or documented training and experience at the surgical table under the supervision of an appropriately trained and experienced liposuction surgeon.

   Strength of Recommendation: Unanimous Task Force opinion.

3. In addition to the surgical technique, training includes instruction in fluid and electrolyte balance, potential complications of liposuction, and tumescent anesthesia and other forms of anesthesia employed.

   Strength of Recommendation: Unanimous Task Force opinion.

Facility in which the procedure is performed and availability of emergency care

1. Liposuction can be performed safely in a physician's office surgical facility, an ambulatory surgical facility, or a hospital operating room.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

2. All liposuction surgeons and designated operating room staff have training in the management of acute cardiac emergencies.

   Strength of Recommendation: Unanimous Task Force opinion.

3. Hospital privileges should not be required to perform tumescent liposuction, but a written plan for management of medical emergencies, including possible transfer, should be in place.

   Strength of Recommendation: Unanimous Task Force opinion.

Preoperative medical and psychosocial evaluation of the patient

1. Liposuction is contraindicated in patients with severe cardiovascular disease, severe coagulation disorders, including thrombophilia, and during pregnancy.

   Strength of Recommendation: Unanimous Task Force opinion.

2. A thorough medical history that gives special attention to any history of bleeding diathesis, emboli, thrombophlebitis, infectious diseases, poor wound healing, and diabetes mellitus is taken. Patients with a medical history of these conditions receive medical clearance prior to undergoing liposuction. The history also includes prior abdominal surgery and problems from past surgical procedures that may influence complications.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

3. The use of all medications, vitamins, and herbs is documented with particular attention to medications that affect blood clotting (e.g., aspirin, nonsteroidal anti-inflammatory agents, vitamin E, and anticoagulants). Drugs that may interact with lidocaine, epinephrine, or sedative and anesthetic agents are noted.

   Strength of Recommendation: Unanimous Task Force opinion.

4. Physical evaluation includes assessment of the general physical health to determine if the patient is a suitable candidate for surgery, and examination of specific sites under consideration for liposuction to check for potential problems.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

5. Psychosocial evaluation includes inquiries about diet and exercise habits; history of weight gain and loss; familial body shape; and evaluation of patient's emotional ability to endure the procedure, their understanding of the limitations of liposuction, and their realistic expectations.

Level of Evidence: L6
Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

6. Selection of preoperative laboratory studies to be performed depends on the type and extent of the anticipated liposuction procedure and the conditions revealed in the history and physical examination.

   Strength of Recommendation: Unanimous Task Force opinion.

7. If indicated by history, system review, or extent of anticipated liposuction procedure, a complete blood count with quantitative platelet assessment, prothrombin time, partial thromboplastin time, chemistry profile including liver function tests, and a pregnancy test for women of childbearing age is sufficient for most liposuction procedures.

   Strength of Recommendation: Unanimous Task Force opinion.

Type of anesthesia employed and perioperative administration of anxiolytics, sedatives, and analgesics

1. Lidocaine is the preferred type of local anesthetic.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

2. If a patient takes medications that inhibit the metabolism of lidocaine, the medications should be discontinued before liposuction, or the total dosage of lidocaine should be reduced.

   Strength of Recommendation: Unanimous Task Force opinion.

3. The recommended maximum dose of lidocaine is 55 mg/kg for most patients. Recommended lidocaine dosages are dependent upon appropriate epinephrine concentration in the tumescent solution.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

4. The recommended concentration of epinephrine in tumescent solutions is 0.25 mg/L to 1.5 mg/L. The total dosage of epinephrine should be minimized, within these limits, and usually should not exceed 50 micrograms/kg.

   Strength of Recommendation: Unanimous Task Force opinion.

5. If the surgeon anticipates that the maximum dose will be exceeded, consideration may be given to dividing the liposuction into separate procedures.

Strength of Recommendation: Unanimous Task Force opinion.

6. Oral anxiolytics, sedatives, or narcotic analgesics at dosages that are not associated with respiratory depression may be used with tumescent liposuction.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

7. Intramuscular anxiolytics, sedatives, or narcotic analgesics may be used with caution with tumescent liposuction, since dose-response can vary widely and may be associated with respiratory depression.

   Strength of Recommendation: Unanimous Task Force opinion.

8. Intravascular anxiolytics, sedatives, or narcotic analgesics may be associated with increased risk of morbidity and mortality if not used properly and in a setting such as an accredited surgical facility or hospital operating room and monitored by appropriately trained and credentialed personnel.

   Strength of Recommendation: Unanimous Task Force opinion.

9. The use of inhalational (general) anesthesia for tumescent liposuction is not recommended.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

Surgical technique/procedure including the performance of concomitant additional surgery, the size of the cannulae employed, the length of time of the procedure, and the volume of fat extracted per session and by body weight

1. Performing liposuction with other procedures should be done with caution, unless all procedures are done under local anesthesia and the recommended dosage for tumescent lidocaine is not exceeded.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

2. The recommended cannula size for liposuction is generally no larger than 4.5 mm in diameter.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

3. The recommended volume of fat removed is in proportion to the fat content and/or size and/or weight of the patient being treated; and the recommended volume of fat removed generally does not exceed 4500 mL in a single operative session.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

4. The dry technique for liposuction is contraindicated.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

5. Liposuction in the treatment of obesity is experimental at this time and is not recommended.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

Type of intra- and postoperative monitoring

1. Baseline vital signs, including blood pressure and heart rate, are to be recorded pre- and postoperatively.

   Strength of Recommendation: Unanimous Task Force opinion.

2. For procedures removing >100 mL of aspirate, there is the capability of continuous blood pressure monitoring, cardiac monitoring with pulse oximetry, and the availability of supplemental oxygen.

   Level of Evidence: L6
   Strength of Recommendation: Unanimous Task Force opinion and weak evidence.

3. Sedated patients have postoperative monitoring until fully recovered and ready for discharge.

   Strength of Recommendation: Unanimous Task Force opinion.

4. A plan for management of medical emergencies is in place.

   Strength of Recommendation: Unanimous Task Force opinion.

Postoperative compression

1. Specialized compression garments, binders, and tape help to reduce bruising, hematomas, seromas, and pain. Anti-phlebitis support hose may be valuable for cases involving the lower legs.

   Strength of Recommendation: Unanimous Task Force opinion.

2. The duration of compression is dictated by physician judgment, the location of the surgery, and the rate of recovery.

   Strength of Recommendation: Unanimous Task Force opinion.

Definitions

Recommendation Rating

Recommendations are based on:

- Unanimous Task Force opinion supported by strong to moderate levels of evidence
- Majority Task Force opinion supported by strong to moderate levels of evidence
- Unanimous Task Force opinion supported by limited or weak scientific evidence
- Majority Task Force opinion supported by limited or weak scientific evidence
- Unanimous Task Force opinion only
- Majority Task Force opinion only

Level of Evidence Rating (See following Criteria)

Strong: Based on high quality scientific evidence

Moderate: Based on good quality scientific evidence

Expert opinion: Based on limited scientific evidence and Task Force opinion

Clinical Option: Intervention that the Task Force failed to find compelling evidence for or against and that a reasonable provider might or might not wish to implement

Level of Evidence Criteria

Attributes of Study on Diagnosis

1. Good diagnostic test
2. Good diagnostic criteria
3. Test and criteria reproducible
4. Proper patient selection
5. At least 50 cases and 50 controls

Level 1 = all attributes 1-5; Level 2 = 4 of the 5 attributes; Level 3 = 3 of the 5 attributes; Level 4 = 2 of 5 attributes; Level 5 = 1 of 5 attributes
High quality evidence = Levels 1 and 2
Good quality evidence = Level 3
Limited evidence = Levels 4 and 5

Attributes of Study on Prognosis

1. Cohort
2. Good inclusion/exclusion criteria
3. Follow-up of a least 80%
4. Adjustment for confounders
5. Reproducible outcome measures

Level 1 = all attributes 1-5; Level 2 = attribute 1 + any 3 of attributes 2-5; Level 3 = attribute 1+ any 2 of attributes 2-5; Level 4 = attribute 1 + any 1 of attributes 2-5; Level 5 = attribute 1 and no other attributes; Level 6 = none of the attributes.
High quality evidence = Levels 1 and 2
Good quality evidence = Levels 3 and 4
Limited evidence = Level 5

Levels of Evidence of Studies on Treatment and Prevention

1. Several randomized controlled trials (RCTs) that demonstrate a significant difference
2. A randomized controlled trial that demonstrates a significant difference
3. A randomized controlled trial showing some difference
4. A nonrandomized controlled trial or subgroup analysis of a randomized controlled trial
5. A comparison study with some kind of control/comparison
6. Case series without control
7. Case report with <10 patients

High quality evidence = Levels 1, 2, or 3
Good quality evidence = Levels 4 or 5
Limited evidence = Levels 6 or 7

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see â œMajor Recommendationsâ).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Adherence to guideline recommendations allows the procedure to be performed with minimal morbidity and no mortality.
- Effective treatment with liposuction surgery may result in improved self-image and patient satisfaction.

POTENTIAL HARMS

Rare but serious surgical complications include:

- Mortality
- Cerebrovascular accident or transient ischemic attack
- Pulmonary thromboembolism
- Fat embolism
- Major skin loss
- Anesthesia complication
- Transfusion complication
- Deep vein thrombosis

Subgroups Most Likely to be Harmed:

- Patients who have a history of bleeding diathesis, emboli, thrombophebitis, infectious diseases, poor wound healing, and diabetes mellitus.
- Obese patients and, for abdominal liposuction, patients with history of prior abdominal surgery.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- Adherence to these guidelines will not ensure successful treatment in every situation. Furthermore, these guidelines should not be deemed inclusive of all proper methods of care or exclusive of other methods of care reasonably directed to obtaining the same results. The ultimate judgment regarding the propriety of any specific therapy must be made by the physician and the patient in light of all the circumstances presented by the individual patient.
- This report reflects the best available data at the time the report was prepared, but caution should be exercised in interpreting the data; the results of future studies may require alteration of the conclusions or recommendations set forth in this report.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

The guidelines were provided to the entire American Academy of Dermatology membership. Upon request, the guidelines have been sent to credentialing bodies.

Finally, the guidelines were provided to state medical boards and/or state legislators.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Coleman WP 3rd, et al. Guidelines of care for liposuction. Guidelines/Outcomes Committee. J Am Acad Dermatol 2001 Sep;45(3 Pt 1):438-47. [52 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001 Jan (electronic version released to the public)

GUIDELINE DEVELOPER(S)

American Academy of Dermatology - Medical Specialty Society

SOURCE(S) OF FUNDING

American Academy of Dermatology operational funds and member volunteer time supported the development of this guideline.

GUIDELINE COMMITTEE

- American Academy of Dermatology Liposuction Guideline Development Task Force
- American Academy of Dermatology Guidelines/Outcomes Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Task Force: William P. Coleman, III, MD, Chair, Richard G. Glogau, MD, Jeffrey A. Klein, MD, Ronald L. Moy, MD, Rhoda S. Narins, MD, Tsu-Yi Chuang, MD, MPH,

Evan R. Farmer, MD, Charles W. Lewis, MD, Barbara J. Lowery, MPH, and the Guidelines/Outcomes Committee*

*Guidelines/Outcomes Committee: Evan R. Farmer, MD, Chair, Abby S. VanVoorhees, MD, Chair-elect, Tsu-Yi Chuang, MD, MPH, Boni E. Elewski, MD, Arnold W. Gurevitch, MD, Robert S. Kirsner, MD, Lawrence M. Lieblich, MD, Marianne N. O'Donoghue, MD, Yves P. Poulin, MD, Barbara R. Reed, MD, Randall K. Roenigk, MD, and Barbara J. Lowery, MPH

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline. This is the first update of a guideline that was published in 1991 (Drake LA, Ceilley RI, Cornelison RL, Dobes WL, Dorner W, Goltz RW, Lewis CW, Salasche SJ, Chanco Turner ML, Alt TH, et al. Guidelines of care for liposuction. Committee on Guidelines of Care. J Am Acad Dermatol. 1991 Mar;24[3]:489-94).

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Not available at this time.

Print copies: Available from AAD, PO Box 4014, Schaumburg, IL 60168-4014, (847) 330-0230 ext. 333; Fax (847) 330-1120; Web site, www.aad.org.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Lowery BJ, Chuang TY, Farmer ER, Lewis CW. Liposuction guidelines technical report. Schaumburg, IL: American Academy of Dermatology, 2000.

Electronic copies: Not available at this time.

Print copies: Available from AAD, 930 N. Meacham Road, PO Box 4014, Schaumburg, IL 60168-4014, (847) 330-0230; Fax (847) 330-0050; Web site, www.aad.org.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on March 21, 2001. The information was verified by the guideline developer on April 11, 2001.

COPYRIGHT STATEMENT

Date Modified: 5/10/2004